



Our Ref. No.: 37231.P004

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Larry Hood, et al.

Serial No.: 08/111,296

Filed: August 23, 1993

For: METHOD FOR MODIFICATIONS
OF VISUAL ACUITY BY
THERMAL MEANS

Examiner:

Art Unit: 2507

INFORMATION DISCLOSURE STATEMENT

UNDER 37 C.F.R. § 1.97

Honorable Commissioner
of Patents and Trademarks
Washington, DC 20231

Sir:

Applicant would like to disclose the following patents pursuant to his duty of candor and good faith under 37 C.F.R. § 1.56. The cited art is listed below and on Form 1449 which is attached, copies of the art are enclosed.

<u>U.S. PATENT NO.</u>	<u>PATENTEE</u>	<u>ISSUE DATE</u>
3,776,230	Neefe	December 4, 1973
4,326,529	Doss, et al.	April 27, 1982
4,381,007	Doss	April 26, 1983
4,461,294	Baron	July 24, 1984
4,729,372	L'Esperance, Jr.	March 8, 1988
4,747,820	Hornlein, et al.	May 31, 1988
4,798,204	L'Esperance, Jr.	January 17, 1989
4,931,047	Broadwin, et al.	June 5, 1990
4,976,709	Sand	December 11, 1990
4,988,334	Hornlein, et al.	January 29, 1991
5,015,227	Broadwin, et al.	May 14, 1991
5,025,811	Dobrogowski, et al.	June 25, 1991

5,137,530	Sand	August 11, 1992
5,174,304	Latina, et al.	December 29, 1992
5,188,125	Kilmer, et al.	February 23, 1993
5,190,517	Zieve, et al.	March 2, 1993
5,195,954	Schnepp-Pesch, et al.	March 23, 1993

FOREIGN PATENT DOCUMENTS

<u>PATENT NO.</u>	<u>PATENTEE</u>	<u>ISSUE DATE</u>
WO90/12618	Spears, et al.	November 1, 1990

OTHER DOCUMENTS

"An Electrothermal Technique for the Alteration of Corneal Curvature," Doss, et al., Los Alamos Scientific Lab, February, 1978.

"A Technique for the Selective Heating of Corneal Stroma," Doss, et al., Contact & Intraocular Lens Medical Jrl., Vol. 6, No. 1, January-March, 1980, pps. 13-17.

"Bipokeratoplasty: using cautery to advantage," Fugo, Ocular Surgery News, February 1993, pps. 101 & 113.

"Combined Microwave Heating and Surface Cooling of the Cornea," Trembly, et al., IEEE Transactions On Biomedical Engineering, Vol. 38, No.1, January, 1991, pps. 85-91.

"Regression of Effect Following Radial Thermokeratoplasty in Humans," Feldman, et al., Refractive and Corneal Surgery, Vol. 5, September/October, 1989, pps. 288-291.

"The Need For Prompt Prospective Investigation," McDonnell, Refractive & Corneal Surgery, Vol. 5, January/February, 1989.

The applicant will discuss the references in more detail below.

U.S. Patent No. 4,461,294 issued to Baron; U.S. Patent No. 4,976,209 issued to Sand; U.S. Patent Nos. 4,326,529 and 4,381,007 issued to Doss are discussed in the Background of the above entitled application.

The Trembly reference discusses a microwave procedure similar to the technique disclosed in the Doss patents.

The Fugo reference discloses a Bipokeratoplasty technique applied to the limbus of the cornea.

The Doss article discusses a procedure wherein the circulating saline electrode (CSE) of the Doss patent was used to heat a pig cornea. The electrode provided 30 volts r.m.s. of power for 4 seconds. The results showed that the stroma was heated

to 70°C and the Bowman's membrane was heated 45°C, a temperature below the 50-55°C required to shrink the cornea without regression.

The McDonnell reference discusses the merits of corneal reshaping by thermokeratoplasty techniques. The article discusses a procedure wherein a stromal collagen was heated by radio frequency waves to correct for a keratoconus condition. As the article reports, the patient had an initial profound flattening of the eye followed by significant regression within weeks of the procedure.

The Feldman reference discusses another thermokeratoplasty technique for correcting hyperopia. Feldman inserted a probe into four different locations of the cornea. The probe was heated to 600°C and was inserted into the cornea for 0.3 seconds. Like the procedure discussed in the McDonnell article, the Feldman technique initially reduced hyperopia, but the patients had a significant regression within 9 months of the procedure.

The remaining art is of general interest. The applicant submits that the above cited art neither anticipates nor renders obvious the present invention.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Ben Yorks

February 17, 1994

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20731 on: Feb. 17, 1994

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February 17, 1994